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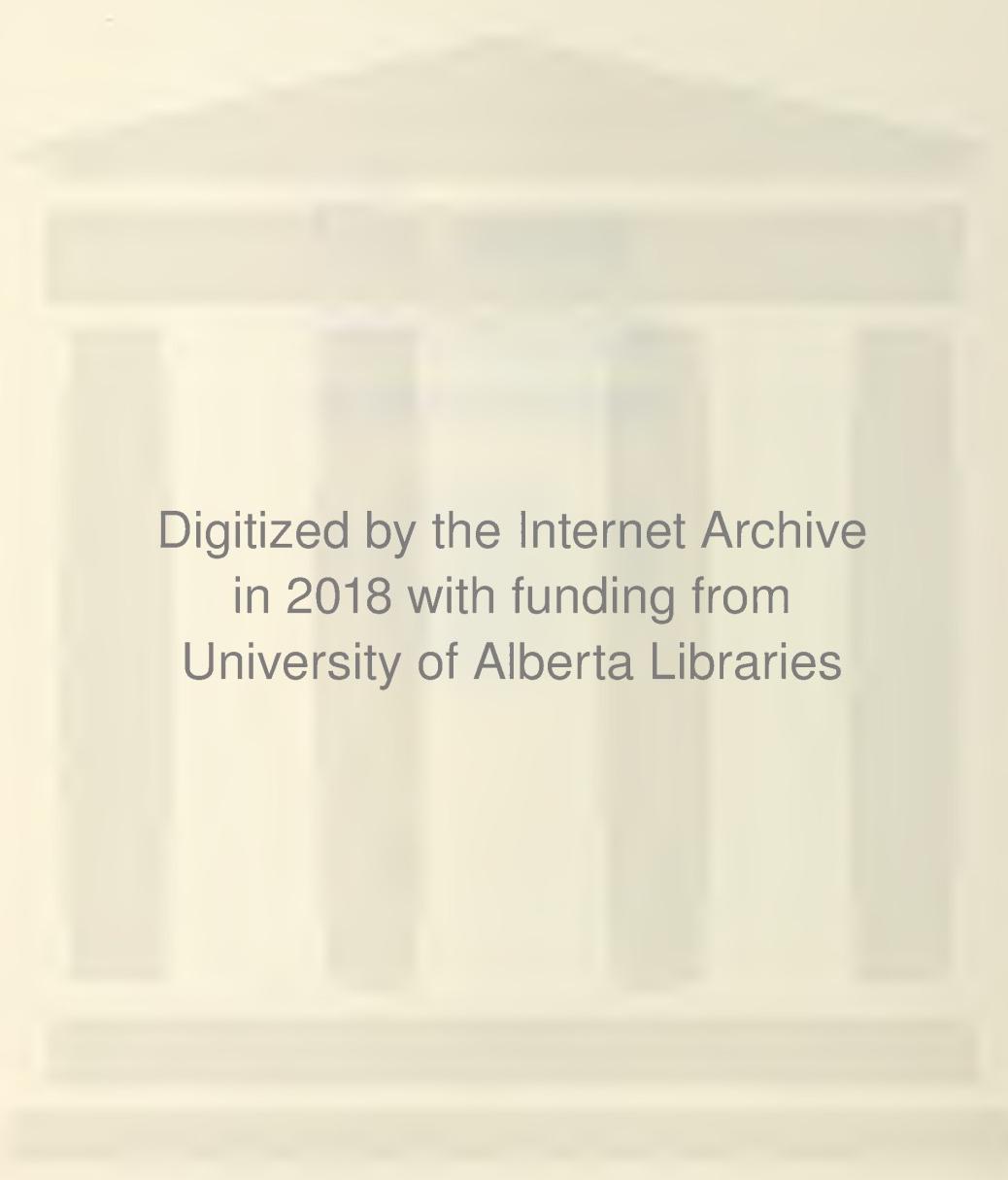
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Faculty of Education

The undersigned hereby certify that they have read
and recommend to the Committee on Graduate Studies
for acceptance, a thesis entitled

'Inventoried Interests in the Professions
as Estimated by Boys of University Entrance Level',
submitted by

Samuel Edward Loring Pollock
in partial fulfilment of the requirements for the
Degree of Master of Education.

THE UNIVERSITY OF ALBERTA

INVENTORIED INTERESTS IN THE PROFESSIONS
AS ESTIMATED BY BOYS
OF UNIVERSITY ENTRANCE LEVEL

A dissertation submitted to the School
of Graduate Studies in partial fulfilment
of the requirements for the Degree of
Master of Education.

FACULTY OF EDUCATION

by

Samuel Edward Loring Pollock
Edmonton, Alberta.

May 1950

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CHAPTER I. INTRODUCTION

The idea for the work carried out in this project had its origin in studies carried on in the Education 574 (Education Clinic) class of 1947-48, and later field work in the guidance of high school students, both carried out under the direction of Dr. H. E. Smith of the Faculty of Education, University of Alberta.

In exploring fields of interest the 'Kuder Preference Record', and the 'Occupational Interest Inventory' by Lee and Thorpe had been used with varying degrees of satisfaction. Several shortcomings of these tests were noted after their fairly extensive use.

(a) Particularly in the Lee and Thorpe the necessity of a choice in all situations introduced some distortion in profile as students often had difficulty in determining a preference for either of the activities presented together.

(b) For administration to groups that are often predominantly from agricultural environments the lack of a 'Natural' field of interest in the Kuder was felt to be unfortunate.

(c) Level of language used in both tests was well suited to the reading and comprehension abilities of high school entrants but did not fully challenge the interest of high school graduates, particularly that group of better students bound for university.

(d) The criticism of language in (c) above also applied to the activities described in many of the items of both inventories. The experience and interest of the university-bound group was not sufficiently challenged.

Dr. Smith suggested that a tentative interest inventory be compiled, possibly on the general pattern of the Lee and Thorpe,

with the matriculation group of high school graduates specifically in mind. The inventory would have to cover those fields of interest encountered by a University of Alberta freshman when faced with the problem of choosing the faculty in which to pursue his studies. It must also, as far as possible, try to minimize the faults stated above.

The following report is an account of the methods and procedures used in the attempt to design such an inventory, the difficulties that appeared as the study progressed, and possible shortcomings that are still present at this stage in development.

CHAPTER II. STATEMENT OF PROBLEM

1. GENERAL AIM

The general aim of the work is to examine the estimated interests and aversions of male students at the time of their entrance to university or shortly before, to discover if possible, patterns of common interests among men about to train for the same profession.

2. SPECIFIC AIM

The particular purpose of the investigation is to obtain the necessary data to construct an interest inventory of which the results could be used as a practical counselling aid in interviewing university freshmen or university-bound high school graduates.

3. CHOICE OF MAJOR FIELDS OF INTEREST

In the beginning choice of the major fields of interest is necessarily arbitrary but is designed to survey those groups of activities for which professional training is provided at the University of Alberta. Analysis of preliminary results may lead to some re-arrangement of the major fields of interest but the basis for changes will still remain more subjective than objective.

4. CHOICE OF ITEMS

The choice of items defining specific activities representative of each of the major fields of interest must, in the first place, be at the discretion of the collector. For this reason it is desirable to compile a much more extensive list than will be needed in the final form of the inventory. After preliminary results are available items will have to be studied individually for their suitability and differentiating significance.

Also to be considered in the choice of items is the nature of

the activities to be described. They must all lie within the scope of university training, or of experience that can be expected reasonably to follow professional training in the major fields listed.

5. LANGUAGE

The language in which the activities are presented must challenge the interest of the individual. Because of the time factor involved in completing any inventory of this type emphasis must be on clarity and brevity of statement.

6. FORM OF THE INVENTORY

The inventory must be set up in a manner to meet as far as possible several important requirements:

- (a) Maximum information in minimum time within the limits of reasonable reliability.
- (b) Provision for the registering of equal interests or aversions.
- (c) Self-administering with a minimum of explanation.
- (d) Provision of simple and speedy methods of scoring and recording.

CHAPTER III. PREVIOUS STUDIES

In general the interests of an individual are defined from the objects and activities which engage his attention. Studies of the various patterns that these may follow have been made from both the subjective or introspective side, and from the objective or observational side. Subjective interests are determined in terms of the feelings that accompany experience with representative objects and activities. By definition, an interest is indicated if the feeling is pleasant, an aversion if the feeling is unpleasant. Objective determination of interests involves the observation of an individual's reactions. To note that attention has been drawn is an objective evidence of interest; to estimate that the subject likes the object to which attention has been drawn is subjective.

Of the investigations already carried out in the field of interests and aversions, the majority have dealt with individual estimates of the feeling associated with certain circumstances. In other words, subjective measurement of interest has been the main field of exploration. Earliest interest inventories were designed in an effort to aid the educational and occupational orientation of the individual; to draw attention to interests present, to suggest the problems upon which recognition of interests might have some bearing, and to stimulate the thought of the individual on this aspect of his personality.

Information on the following early investigations in the field of interest measurement has been drawn chiefly from the work 'Measurement of Interests' - Fryer (Henry Holt & Co., 1931). To quote Dr. Lewis M. Terman this book is a 'critical and interpretative summary of all the investigational studies made in the field

of interest measurement' prior to its time of publication.

1. In 1913, Schneider engaged in personnel work among engineering students, devised a list of fifteen opposing pairs of work characteristics of the following type:

Indoor	--	Outdoor
Mental	--	Manual
Dynamic	--	Static

Students were required to indicate preference for one or the other of each pair of broad characteristics listed. Schneider made use of the results in occupational orientation of his students.

2. 'Analysis of Work Interests' by Miner.

Miner began work on his interest inventory in 1918 and published it in revised form in 1922. Its stated purpose was 'to help to discover special interests and abilities by suggesting how to observe one's own likes and dislikes' (1). It was designed especially for use with students of high school age in the orientation of their work interests. In three different sections of his analysis Miner made use of classification of activities somewhat after the same manner as Schneider. One such section divides all occupations into

- (a) Making useful things.
- (b) Producing artistic results.
- (c) Dealing with people.
- (d) Thinking out problems.

Another section offers thirty-seven paired contrasts of the following type:

Skilled heavy work.	---	Skilled hand work.
Broad planning.	---	Attention to details.

Still a third section lists such activities as

- () Growing plants, as in farming, gardening, etc.
- () Operating engines, as locomotives, automobiles, etc.

Although his findings at this time were based on the study of comparatively small samples, Miner concluded that there was a possible basis for separation shown in the general interest patterns of the various occupational groups. This conclusion has been supported by later evidence.

In these, and in other similar 'activity' inventories coming into use about the same time, investigators discovered two serious possibilities of error. These were:

(a) An Information Error which depended upon the knowledge of the person completing the inventory. A list of broad occupational activities as suggested in (1) and (2), above, assumes that the person making the choice has equal acquaintance with all the fields represented. Investigation showed that the fewer the occupations known in some detail the less valid was the estimate of interest.

(b) A Generalization Error which grew out of the possible scope of the items listed. That is, the broader the activity on which interest was to be estimated the greater would be the number of factors contributing to the estimate, hence a proportional possibility of error.

Subsequent studies by Fryer (2) showed that of a group of 513 individuals, 282 were unable to generalize on such a broad basis. The aim of investigators, then, became to reduce the scope of the generalization in an effort to increase the validity of the estimate of interest.

3. 'Occupational Preference Inventory' by Brainard.

Brainard prepared several forms of activity inventory in which

he attempted to narrow the scope of items presented. At high school level he chose fifteen broad, major activities and represented each in his inventory by ten typical, specific activities. Separate inventories were designed for boys and girls, and administration to various groups brought out enough differentiation of interest patterns to warrant use of the results in vocational guidance (3). Brainard's inventory has been widely used, it has undergone many revisions and has appeared in various forms at high school and college levels. It is still in use and the present high school edition is a 1945 revision.

Brainard also introduced a new technique in scoring. A scale of seven degrees was used in asking the subject to estimate his feeling toward each activity. The scale was arranged as follows:

(1)	(2)	(3)	(4)	(5)	(6)	(7)
Very Un- pleasant	Quite Un- pleasant	Slightly Un- pleasant	Neutral	Slightly Enjoy- able	Quite En- joyable	Very En- joyable

The numerical value of the degree checked was to be used as a weighting device in the calculation of scores. However, scores on this basis were not standardized as further investigation showed very low reliability in any attempt at detailed classification of feeling.

4. 'The Oberlin Vocational Interest Inquiry' by Hartson and Brentlinger.

In 1925 Hartson began work on an inventory to study the interests of college students. He planned to use the results of this inventory in vocational guidance. In the 1928 revision of the inventory, on which Hartson and Brentlinger worked together, occupational activities were classified only from the point of view of purpose. Twenty major activities were selected, and for each of

these nineteen representative, specific activities were compiled. The three hundred eighty items were arranged in pairs for comparison of opposing fields. Preferences were indicated as follows:

1 E I 4

'Judge stock at a fair' () () () () 'Give professional advice on stock raising'

Preference for the item on the left is shown by checking in column 1; about equal preference for both items is checked under E, indifference to both under I, and preference for the item on the right is entered under 4.

Results of this inventory showed a considerable overlapping of the occupational fields chosen. It was also noted that items had to be chosen very carefully to obtain a significant differentiation of interests. Hartson and Brentlinger made no use of the 'E' and 'I' scores.

At this point mention must be made of early attempts to standardize techniques and results of interest measurement.

Work on an interest inventory in standardized form began in 1919 at the Carnegie Institute of Technology under the direction of Clarence S. Yoakum. While some studies had preceded this one none had followed a standardization technique based on statistical evaluation. A list of approximately 1000 questions was compiled covering interest situations from early childhood through adolescence to maturity. This list was divided into genetic groups designed to correspond to the various growth periods, and was used as a basis for several inventories designed and studied by Yoakum's workers.

4. Moore carried out a study of interests among a group of Westinghouse engineers (4).. Ten occupations of interest to those engaged in mechanical pursuits were opposed to ten of interest to

those engaged in pursuits primarily social. Fourteen judges made the selection of occupations and classification was unanimous for each one included. The purpose of this inventory was to differentiate, if possible, the interests of engineers engaged in sales promotion from the interests of those engaged in production and design.

5. 'Questionnaire of Interests and Preferences' by Craig.

Craig's study concerned the interests of the retail clerks in a large department store. He experimented with three inventories, 'Occupational Preferences', 'Record of Preferences', and 'Interest Blank' in an effort to get an accurate and consistent measure of the appeal of a situation to an individual (5).

6. 'The Carnegie Interest Inventory'.

By 1921, Ream, Freyd, and others of Yoakum's group had developed this inventory which may be called the first standardized inventory of interests. It consisted of two parts:

(a) A section of occupational interests calling for choices of occupations. The list included seventy-two samplings of outdoor and indoor, solitary and social, scientific, literary, executive, sales, and mechanical occupations.

(b) A section of general interests involving 126 likes and dislikes based on physical and mental characteristics of people.

On Part (a) the scoring permitted the expression of three degrees of preference: L (Like), ? (Indifferent), D (Dislike).

On Part (b) the investigators tried to get a finer distinction of feeling, and the completion scheme allowed for five separate responses: L! (Strong liking), L (Average liking), ? (Indifference), D (Average dislike), D! (Strong dislike). From this inventory Ream and Freyd hoped to develop scoring keys which would

distinguish group interests on an objective basis (6) (7). A revision of the inventory appeared in 1923 in which certain items that had shown little distinguishing significance were dropped, and new items added.

In the several inventory forms tried by the Carnegie investigators, symbols for the estimation of interest and aversion varied from three to seven. Study of the results led to the conclusion that very little significance could be attached to a degree of feeling expressed by an individual over a given situation. The only practical differentiation possible was on a basis of 'Liking', 'Disliking', or 'Being indifferent'.

For his investigation of social and mechanical interests Moore had decided beforehand what the significant items in his inventory were to be, basing his selection on purely subjective judgment. Ream set out to determine his significant items objectively, if possible. After administering his inventory to several homogeneous occupational groups he tried to discover what items were significant in distinguishing the interests of one group from those of another. His method was as follows:

The completed inventory forms from two occupational groups, A and B, were compared item by item. The percentage of each group indicating 'L' (Like) on a given item was calculated. If this percentage was significantly large (actual level not defined in 'Fryer') the difference between the percentage of Group A marking 'L' and the percentage of Group B marking 'L' was found. Then the standard error of this difference was found by Yule's formula (8).

$$E = \frac{P_1 Q_1}{N_1} + \frac{P_2 Q_2}{N_2}$$

In Yule's formula

E is the standard error of difference sought.

P₁ is the percentage of Group A indicating 'L' on the given item.

Q₁ is the percentage of Group A not indicating 'L'.

P₂ is the percentage of Group B indicating 'L'.

Q₂ is the percentage of Group B not indicating 'L'.

N₁ and N₂ are the numbers of individuals in Groups A and B respectively.

Where the difference between the percentages of Group A and Group B indicating 'L' for the given item was equal to the standard error of the difference, the item was used as a distinguishing unit in the scoring key. All items not meeting this criterion were discarded for distinguishing purposes as between Groups A and B.

The various forms of the Carnegie Inventory were borrowed and adapted by other investigators, and it has formed the general pattern for many of the inventories now in popular use.

7. 'General Interest Inventory' by Kornhauser.

Kornhauser of the University of Chicago adapted the Carnegie Inventory for use with college students. His items sampled a long list of general activities without specific reference to vocations. He used the five degree method of indicating preference as outlined for Part (b) of the Carnegie Inventory, above. However, in his study of results Kornhauser made no use of the two extremes; markings were analyzed as 'Like', 'Indifferent', and 'Dislike'. (9)

8. 'Minnesota Interest Inventory' by Paterson.

This inventory was another adaptation of the Carnegie in which both general and occupational items appeared. It is noted here because it introduced a new symbol in its completion scheme. This new symbol was 'U' to indicate an item unfamiliar to the person

completing the inventory. This improvement was designed to distinguish between indifference and ignorance.

9. Development of the Interest Inventory at Stanford University.

Probably the most extensive research in the interest field has been carried out at Stanford University under the direction of Prof. E. K. Strong Jr. This study, started in 1923, is still being carried on.

(a) The first development at Stanford was Cowdery's 'Interest Report Blank' (10). This inventory was patterned after the Carnegie and included a general and an occupational section. The completion scheme used only the three symbols, 'L', '?', and 'D' for the estimation of interest or aversion. Items were based on preference for occupations, types of people, sports and amusements, pets, reading, and school subjects. It was the apparent promise of this type of interest inventory that set Strong off on his monumental study.

(b) The 'Purdue Interest Blank' by Remmers (11) took Cowdery's form as a pattern and attempted a seven-degree analysis of interest and aversion. Remmers found that the expression of liking and disliking in so many degrees was unreliable, and eventually combined his results into the three degrees used by Cowdery.

(c) Strong's first interest inventory made its appearance in 1928. Study of Cowdery's 'Interest Report Blank' had convinced him that validity would be improved by increasing the number of items used. Cowdery's 263 items were increased to 420 which were classified into the following eight parts:

- i. Occupations.
- ii. Amusements.
- iii. School Subjects.
- iv. Activities.

- v. Peculiarities of People.
- vi. Order of Preference of Activities.
- vii. Comparison of Interest between Two Items.
- viii. Rating of Present Abilities and Characteristics.

Another refinement in Strong's inventory was the instruction to the subject to work rapidly since Strong felt that an immediate estimation of feeling was more reliable than one based on reflection. Three degrees for the estimation of interest or aversion were considered to be adequate.

In follow-up work with 282 graduates who had completed his inventory as Stanford University seniors, Strong found that 71 per cent were establishing themselves in the occupations for which their interest scores had been highest or second highest. Twelve per cent had chosen occupations in which their interest rating had been low.

Cowdery and Strong contributed to the advances being made in objective scoring by adopting and improving the method pioneered by Ream. It was essential that each occupation have its own scoring key, and each of these keys was based on the results of inventories completed by 250 individuals established in the occupation for which the key was being made. The interests of this homogeneous group were compared with those of an unselected group of 'men in general'. The significance of each item for a particular occupation was determined by comparison of percentages of the occupational group marking 'L', '?', or 'D' with percentages of the 'men in general' group marking the same symbol. By a complex system of weighting formulas each item was reduced to a positive or negative value with respect to the occupation being considered. The interest

score of an individual for a given occupation became the algebraic sum of the key values for the preferences and aversions marked.

Before concluding this section it might be well to mention two or three of the more popular interest inventories available for use at the high school and junior college level today. As noted above, the latest revisions of Strong's 'Vocational Interest Blank', and Brainard's 'Occupational Preference Inventory' are widely used. In addition the following are fairly representative of the instruments for interest measurement being used at present:

10. 'Kuder Preference Record' by G. Frederic Kuder (13).

This inventory has been recommended by the Dept. of Education for Alberta, and is stocked by its School Book Branch, therefore it is probably the best known and most generally used inventory in Alberta at present.

The 'Kuder Preference Record' appeared in its original form in 1935 and has undergone revision at least twice since then. The form in present use divides activities into nine broad fields:

- (a) Mechanical (b) Computational (c) Scientific (d) Persuasive
- (e) Literary (f) Artistic (g) Musical (h) Social Service
- (i) Clerical.

One hundred sixty-eight specific activities within these fields are arranged in groups of three, and the subject is required to indicate the activity of greatest and of least preference within each triad. In effect this gives three choices between pairs of items for one reading of each group of three. Scoring is simplified by a specially designed answer pad which automatically sorts the preferences indicated into their respective general fields.

The 'Kuder Preference Record' has undergone extensive standard-

ization procedures and considerable data are available with respect to its reliability and validity. Its nine broad fields of activities are relatively distinct with published coefficients of intercorrelation quite low. Greatest intercorrelation is between Computational and Clerical fields where coefficients run from 0.411 to 0.561 as calculated on six separate test groups. On the other side coefficients of intercorrelation from -0.302 to -0.430 are found between the Scientific and Persuasive fields calculated on the same six test groups. All other coefficients of intercorrelation lie between these extremes and zero.

The Kuder 'Manual' also provides a further service in relating interest profiles as derived from the 'Preference Record' to a wide field of specific occupations.

11. 'Occupational Interest Inventory' by Lee and Thorpe (14).

This inventory is also of the activity type and makes six major divisions in the occupational field. These are: (a) Personal-Social (b) Natural (c) Mechanical (d) Business (e) The Arts (f) Scientific.

Forty specific activities have been collected for each of the major fields and in Part 1 of the inventory these are arranged in matched pairs, each major field being paired eight times with each other major field. The activities described in these items are drawn almost exclusively from the 'Dictionary of Occupational Titles'. Specific activities are classified as 'Low', 'Average', or 'High' and in each matched pair the level of the two items opposed to each other is the same. The basic interest profile is derived simply from the total preferences indicated in each of the major fields. In addition an attempt is made to classify the type of interest within each field as 'Verbal', 'Manipulative', or 'Computational'.

This is accomplished by totalling choices for certain specified items where the activity described is obviously one of the three types named immediately above.

Part 2 of the inventory presents activities in groups of three, each triad representing three levels from the same major field. This section is designed to estimate the level, from routine or unskilled to professional or administrative, at which the individual would prefer to work in his chosen field.

The object of the authors of this inventory is to identify the occupational field in which the individual would be most likely to be happy. They hold that other factors are more significant than interest in the choice of a specific occupation.

12. 'Vocational Interest Inventory' by Glen U. Cleeton. (15)

This inventory is mentioned because it is another offspring of the original Carnegie studies. Separate forms are used for men and women, and in each case interest is estimated in ten broad fields of closely related activities. Nothing further will be said of the Cleeton Inventory since it has contributed little in the way of ideas to the present work.

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CHAPTER IV. RESEARCH PROCEDURES AND EXPERIMENTAL DESIGN

1. The collection of a large number of items describing many specific activities in each of the general fields of interest chosen for exploration.
2. The matching of these items in pairs so that each field of interest is represented the same number of times, and appears in opposition to each of the other fields an equal number of times.
3. Provision of a scheme of inventory completion that would allow an expression of interest in either item of a matched pair, expression of equally strong interest in each, or expression of little interest in either.
4. Administration of this long list of matched pairs of items, or as it might be called, prototype inventory, to a representative group of boys at High School graduation or University entrance level. Candidates chosen were, for the most part, approaching full matriculation standing.
5. Analysis of these sample inventory sheets with the following objectives:
 - (a) To discover the reliability of items presented in each field. Scores for each major field in ^{the} first half of the inventory were correlated with corresponding scores in the second half to discover the consistency of items chosen for each field.
 - (b) To discover the validity of the test. Correlation between scores in various fields as an indication of the differentiating power of the items presented. Comparison of individual score profiles with stated field of occupational interest.

- (c) To screen out items of little differentiating value by comparing total indications of preference for each item in the inventory.
 - (d) To screen out items which are unsuitable because of little indication of preference, whether through their unfamiliarity or for some other reason.
6. After careful study of the results of the analysis in (5), the selection of a set of matched pairs of items which might be completed in a maximum time of one-half hour. At this stage much better weighting in the items opposed to each other should be possible.
7. A study of the items discarded from the original long inventories to discover, if possible, some of the characteristics of the activities described that lead to fairly general preference on the one hand, or rejection on the other.

CHAPTER V. THESIS PROPER

1. Classification and Definition of the Broad Fields of Interest to be Studied.

Choice of the fields of interest to be studied had to be based on a subjective analysis of the professions for which training is available at the University of Alberta. In the case of certain faculties or schools their titles seemed to mark a natural division of interests; in others separation is much more indefinite, and the danger of overlapping appeared imminent. Final selection was limited to eight general fields of interest classified as follows:

(a) Agriculture

The activities chosen to represent this field were largely agricultural in their implication although there was a strong temptation to include activities related to forestry and natural history. However, since the inventory was to be, primarily, for the fields of training available at the University of Alberta items referring to the latter two subjects were kept to a minimum.

(b) Arts

This was a field of interest rather difficult to define and even more difficult to keep within limits. Representative activities were taken to be those commonly termed 'cultural', namely, those associated with art, sculpture, music, drama, literature, and the study of languages and history from the viewpoint of appreciation. There was a definite effort to avoid the fields of philosophy, psychology, and human relations.

(c) Commerce

Activities here were chosen consistently from the field of business. This division lent itself easily to definition.

(d) Education

Interest in education was assumed to be evident from preference for activities which emphasized the instruction of others. However, interest in people, social situations, and subject matter could not be avoided, thus offering one of the most likely fields in which overlapping could occur.

(e) Engineering

Representative activities for engineering dealt almost entirely with the theory and practice of adapting physical forces and materials to the uses of humanity. Definition of this field proved to be quite straightforward.

(f) Law

Legislation, interpretation of the law, and to a lesser extent, law enforcement contributed most of the items for this field of interest. Chief danger came from frequent references to history where there was a possibility of conflict with Arts.

(g) Medicine

Careful consideration of the fields of Dentistry, Medicine, and Pharmacy did not encourage the policy of giving each full status as a major division of professional interest in this inventory. Neither did the attempt to state a group of activities which would represent all of them fairly prove very satisfactory. As a result the activities described to represent this field of interest are weighted heavily to Medicine.

(h) Social Science

This is another broad and somewhat indefinite field. The activities chosen to represent it are drawn from the study of theology, philosophy, and psychology, and from the practice of social

service and Christian ministry. It offers considerable danger of overlapping other fields, particularly Education, Medicine, and Arts.

2. Collection of Items for the Prototype Inventory

Choice of activities to represent each of the major fields had to be based at this time on the judgment, and perhaps the bias, of the collector. The main source of ideas for this extensive list of activities was a comprehensive selection of calendars from Canadian universities. A minor source of items was the 'Dictionary of Occupational Titles'. Items were limited to activities and ideas encountered in the course of university training, and to experiences that conceivably might occur in the corresponding fields after establishment in a profession.

Criteria for Assembling and Stating of Items (Adapted from Fryer: 'Measurement of Interests', Page 87. Garretson's 'Preference Questionnaire'):

- (a) The activities described must fall within a reasonable range of actual and vicarious experience for the group whose interests are being estimated.
- (b) Specific activities must be selected to cover as wide a sample of experience as possible within each of the major fields of interest chosen.
- (c) Meaning must be clear.
- (d) Items should be of a type that will lend itself readily to some objective method of scoring.
- (e) Possible choices in each field must be of a sufficient number and variety to provide a definition of the subject's attitude in any field where a significant difference, either positive or negative, of interest occurs.

- vi. The need for explanation and direction in administration should be kept to a minimum.
- vii. Occupational reference must not be too obvious yet has to avoid risk of misinterpretation.
- viii. Between fields the items chosen must strike a balance in the general level of activities chosen.
- ix. Within each major field there must be a fair balance between 'glamor' and the less attractive activities associated with the field.
- x. In its final form the test should allow completion in not more than thirty minutes.

3. Assumptions Governing the Design of the Inventory

The following assumptions were made as a basis for final selection, stating, and arrangement of items:

- (a) At High School graduation level the vocabulary of the student is considerable. No effort should be made to 'talk down' to these people if their interest is to be challenged and held.
- (b) A student's experience is greatest in his field of greatest interest; therefore, items somewhat beyond the accepted High School level of knowledge will be recognized and understood by students interested in the major field that such items represent.
- (c) Since so much of University training deals in abstract reasoning the student with professional ambitions must be interested in working with ideas. This is justification for the emphasis on theory, reason, and research.
- (d) Since ease of completion and scoring are major considerations in the design of this inventory the arrangement of

items in opposed pairs offers the most promising form of presentation.

(e) Scheme of completion must not demand differentiation of interest between two items where no difference exists in the subject's mind. Four symbols are provided by which interest in one or the other, both or neither of the items may be indicated.

4. Arrangement of Items

Each field of interest was canvassed in turn until a large number of tentative items were listed. A basic table was then drawn up in which each field of interest was paired once with each other field. (See Table I). For the eight fields of interest to be studied this made twenty-eight pairs of items. This basic table was repeated sixteen times in the original long inventory. Item order was changed at each repetition so that no recognizable cycle would appear in the recurrence of choices. Such an arrangement resulted in 448 matched pairs of items. In fitting the pre-selected items into this pattern care was taken to try to match items which represented somewhat the same level of activity within their respective fields. Arrangement of items in horizontal rather than vertical pairs was favored, and a separate answer sheet was provided which listed the four symbols, 'L' preference for left-hand item, 'B' equal interest in both items, 'N' little interest in either, 'R' preference for right-hand item.

Examples:

		L	N	B	R
(a)	Read mystery stories.			Read historical fiction.	— — — X
(b)	Mix chemicals in prescribed proportions.			Raise registered seed grain.	— X — —
(c)	Teach a high school class in social relations.			Interview famous people.	— — X — (Answers on separate sheet.)

1.	Arts	versus	Agriculture
2.	Commerce	"	Education
3.	Engineering	"	Law
4.	Medicine	"	Social Science
5.	Agriculture	"	Commerce
6.	Education	"	Engineering
7.	Law	"	Medicine
8.	Social Science	"	Arts
9.	Education	"	Agriculture
10.	Medicine	"	Commerce
11.	Law	"	Education
12.	Engineering	"	Social Science
13.	Arts	"	Medicine
14.	Agriculture	"	Engineering
15.	Social Science	"	Commerce
16.	Medicine	"	Education
17.	Law	"	Arts
18.	Engineering	"	Medicine
19.	Social Science	"	Agriculture
20.	Arts	"	Commerce
21.	Agriculture	"	Law
22.	Education	"	Social Science
23.	Engineering	"	Arts
24.	Commerce	"	Law
25.	Medicine	"	Agriculture
26.	Arts	"	Education
27.	Law	"	Social Service
28.	Engineering	"	Commerce

TABLE I: BASIC PATTERN FOR ITEM ARRANGEMENT -- This pattern was used both in the prototype and in the final form of the inventory.

5. Assembly of Data

Dr. H. E. Smith arranged for the mimeographing of the prototype inventory and answer sheet by the Faculty of Education office staff. The next step was the administration of the inventory to a representative group of boys at about the desired academic level. The data analyzed in this study were taken from seventy answer sheets completed by Grade XII boys attending the high schools at Calmar, Wetaskiwin, Ponoka, Lacombe, and Red Deer, as well as a small number from Dr. Smith's Education Clinic.

Scoring masks were prepared to cut down the labor of checking as far as possible. The masks for each field showed only those spaces in which positive answers would be indicated. Credit for a positive estimate of interest was given for either

- (a) An unqualified preference for the item, or
- (b) Equal interest shown in both items.

This scoring policy was suggested by reports of the findings of Brainard, Remmers, and several of the Carnegie group as outlined in Chapter III of this study. All the evidence produced by these investigators pointed to the unreliability of estimated degrees of feeling. The subject either liked, felt aversion to, or had no particular feeling with respect to a given activity. The investigator was not justified in assuming any more than this when degrees of feeling were expressed with regard to a single activity. The situation here is somewhat different in that two activities are compared and a preference for one over the other may be shown. The parallel lies in the assumption that expression of interest in one item of a pair in no way detracts from a possible strong interest in the other, and in such a case both items are entitled to as much weight in assessing overall interest as the item for which unqualified preference is shown.

6. Comparison of the Frequencies with which Interest was Indicated in Each of the Eight Major Fields

Decile	Agric.	Arts	Comm.	Educ.	Engin.	Law	Med.	Soc. Sci.
10	97	83	104	104	111	104	104	111
9	79.3	54.2	57.8	68.2	99.8	58.3	66.5	65.3
8	63.0	43.4	47.6	49.0	93.3	45.5	56.0	49.0
7	49.0	32.2	36.8	40.2	87.5	38.1	47.8	42.0
6	33.8	29.2	30.3	34.3	78.8	32.7	38.5	38.5
5	26.4	25.7	26.0	29.4	69.1	27.4	31.1	35.0
4	21.0	22.4	22.5	25.3	63.0	23.3	26.1	30.9
3	15.6	18.7	16.3	21.5	56.9	19.3	21.6	25.7
2	9.6	14.6	11.3	16.3	42.0	15.6	16.3	18.7
1	4.4	9.8	7.5	11.4	24.5	10.9	10.9	12.8

TABLE II: Norms as derived from the total positive indications of interest on a sample of 70 answer sheets completed by Grade XII boys. (In each case the value given is the top limit of the decile.)

In each major field the possible total of positive answers was 112. In Table II the value given for the top of the tenth decile in each case is the highest score which occurred in that field. With further data available the values given in Table II would form the basis for a profile sheet of the eight fields of interest studied. However, since the major purpose of the prototype inventory was to examine and select items for a shorter, final form of the inventory, establishment of norms based on these 896 less carefully selected items has not been carried any further.

Of the seventy boys contributing answer sheets to this study, taking the figures given for Agriculture as an example, the top tenth showed interest in more than 79 activities classified as represent-

ative of the Agricultural field. The average number of Agricultural activities found interesting, that is for the fifth and sixth deciles of the group would fall approximately between 21 and 34. The bottom tenth of the group found less than five Agricultural items of interest out of the 112 presented. Other fields may be interpreted similarly.

The data of Table II contradict a theory held when the inventory was under construction. It was suggested that there would likely be a common factor of cultural interest held by most individuals. This common factor would have a tendency to raise scores in the field of Arts, and conceivably, might be high enough to require special measures. Instead, this tendency is obvious in the field of Engineering. The bottom tenth of the sample group find up to 24 interesting activities in Engineering, a top level for the first decile which is approximately twice that of any other. Study of individual items in the answer sheets reveals a considerable portion of this common interest in those activities which imply 'doing', not only in the field of concrete objects but in the field of symbols as well. Examples of highly popular activities with number of times each was chosen:

- (a) Study seismographic survey data and pick a likely place to drill for oil. (51/70)
- (b) Combine chemicals to produce new substances. (49/70)
- (c) Earn part of your university expenses as a laboratory demonstrator. (49/70)
- (d) Use differentiation as a tool in solving the problems of engineering. (43/70)

Some influence is doubtless exerted by the 'glamor' associated with Engineering in the conversation of many of these same boys, although all effort was made to keep this aspect in its proper perspective in choosing items.

	Median	Mean	Standard Deviation
Agriculture	26.4	34.7	27.4
Arts	25.7	28.5	17.4
Commerce	26.0	29.5	20.4
Education	29.4	34.5	21.7
Engineering	69.1	67.0	27.6
Law	27.4	31.7	20.3
Medicine	31.1	36.2	22.8
Social Science	35.0	36.5	21.2

TABLE III: Median, Mean, and Standard Deviation for the frequency distributions in each field of all showings of positive interest on the prototype inventory.

The figures of Table III show that in all fields except Engineering the distributions are skewed to the left, that is, there is a somewhat heavier concentration of frequencies in the lower ranges. Evidence of this lies in the fact that Means are higher than Medians thus showing the effect of a smaller number of extreme scores in the higher brackets. (See Appendix)

The distribution in the Engineering field is skewed slightly to the right indicating smaller frequencies in the lower ranges.

In all fields but Engineering the Median falls in the range 25 to 35 indicating comparable numbers of activities in each field that appeal to general interest. This is taken as evidence that the level of items chosen for seven fields has been quite consistent. Reasons for the discrepancies in the Engineering field have not been reliably determined.

Size of the Standard Deviations indicates considerable scattering in each distribution which is evidence that the activities listed have differentiating value. However, no measure of this overall characteristic in the inventory has been attempted.

7. Consistency of Items Throughout the Individual Fields

The consistency of the activities chosen to represent each field of interest was studied by comparison of split-half scores. Pearson's coefficient of correlation (r) was calculated between first and second half totals for each of the fields of interest to discover the extent to which the activities of one field throughout the inventory were consistent in their appeal to the individual.

Field of Interest	(r)
Agriculture	0.925
Arts	0.866
Commerce	0.951
Education	0.862
Engineering	0.830
Law	0.849
Medicine	0.868
Social Science	0.841

TABLE IV: Correlation of Split-Half Total Scores in each major field. (For method of calculation, see Appendix.)

Both Cleeton and Thurstone use comparable methods for demonstrating the reliabilities of their interest inventories. Cleeton (1) correlates odd numbered items with even-numbered items and for the eight fields of his inventory quotes coefficients of correlation ranging from 0.822 to 0.910, a level of reliability with which the data of Table IV compares favorably. Thurstone (2) uses the split-half method and reports coefficients from 0.90 to 0.96 for the ten major fields of his 'Interest Schedule'.

- (1) Cleeton: 'Manual of Directions for the Cleeton Vocational Interest Inventory'. Page 28.
- (2) Thurstone: 'Thurstone Interest Schedule Manual'. Page 9.

8. Overlapping of Fields

Study of the answer sheets gave rise to the impression that in certain fields, due either to an inherent similarity of activities or to faulty choice of items, there was an undesirable amount of overlapping. The two fields in which this characteristic was most obvious were those of Education and Social Science. Among the eight fields of interest twenty-eight possibilities of intercorrelation need to be explored to give a complete picture of the extent of overlapping in the inventory. It is hoped that the careful selection of items for the final form of the inventory will have lessened this fault somewhat; in the meantime fourteen intercorrelations have been calculated (Pearson's 'r') with results as shown in the following table.

	Agric.	Arts	Comm.	Educ.	Engin.	Law	Med.	S. Sci.
Agric.		-0.036	0.118		0.239			
Arts				0.658		0.321		0.656
Comm.					0.658	-0.028		
Educ.					0.111	0.419		0.748
Engin.						0.269		
Law							0.610	
Med.								0.247
S.Sci.								

TABLE V: Intercorrelation of scores for fourteen pairs of fields.
(Calculated from positive interests indicated on the
answer sheets of 70 Grade XII boys.)

As expected a significant positive correlation is shown between Education and Social Science. This fact presents the problem of whether to combine the fields or to attempt the modification of items in the hope of achieving greater differentiation. In the

tables of intercorrelation published for the Kuder 'Preference Record' (1) coefficients as high as 0.561 are quoted. However, these are exceptional and approximately 90 per cent of the Kuder coefficients fall between -0.350 and 0.350. Of the fourteen coefficients of intercorrelation in Table V, 6 or 43 per cent fall outside the Kuder range quoted above. While three or four of the pairs of fields correlated were picked because of a belief that they would show overlapping, the rest were chosen at random. The calculation of the remaining fourteen possible intercorrelations, therefore, would be very unlikely to make the situation look any worse; neither could they be expected to cut down significantly the evidence of this high ratio of overlapping. Precautions have been taken in the selection of items in an effort to minimize this fault in the final form of the inventory. Further study must await the results of these changes.

9. Significance of 'Neither' Scores

In compiling the test items emphasis was placed on activities involving theory, research, and abstract thinking. There seemed a possibility that students who were not particularly able academically might show an abnormally high score in the rejection of these activities. Mental ability scores based on the Otis Higher Form 'A' and Form 'B' were available for forty boys of the Composite High School at Red Deer who had completed the inventory. Pearson's coefficient of correlation was calculated for these I.Q. scores and the 'Neither' scores on the corresponding inventory answer sheets. The coefficient of correlation was found to be -0.203. While the direction of correlation was that expected it was hardly marked enough to be very significant.

(1) Kuder: 'Revised Manual for the Kuder Preference Record'. Page 20.

10. Relation Between Stated Occupational Preference and Field of Interest as Shown on the Inventory

Fifty-four of the seventy answer sheets studied had one or more occupational preferences noted in the spaces provided. Allowing weights of 3, 2, and 1 for first, second, and third choices respectively, the scores for the occupations mentioned most often totalled according to Column (a) in Table VI, below. Fields of highest interest on the inventory were determined by placing scores in their decile ranks according to Table II. Weights of 3, 2, and 1, were again allotted to first, second and third highest fields respectively. Total scores for the inventory fields of interest are shown on this basis in Column (b) of Table VI

(a) Stated Occupational Preference

Engineer (all branches)	74
Teacher	43
Agriculture	33
Accountancy	21
Pharmacy	17
Forestry	11
Medicine	8
Laboratory Technician	8
Ministry	7
Aviation	7
Law	6
Professional Athlete	5
Armed Services	4

(b) Field of Highest Interest According to Inventory

Engineering	55
Medicine	53
Agriculture	50
Education	36
Commerce	35
Law	34
Social Science	34
Arts	26

TABLE VI: Comparison of Occupational Preferences and Inventoried Interests.

Column (a) again emphasizes the general attitude toward Engineering. Since the fields of interest covered by the inventory are

more restricted than the occupational choices of Column (a), some of the answer sheets contributing to Column (b) totals carry full weight in fields not necessarily of highest interest to the individual completing the inventory. This would be true of preferences for Aviation, Professional Athlete, and Armed Services as well as several other occupations mentioned only once. Pharmacy and Laboratory Technician would contribute to Medicine on the inventory; Forestry to Agriculture, and so on.

11. Basis of Item Selection for the Final Form of the Inventory

Field of Interest	Mean Number of Positive Answers per Item	Standard Deviation	Range of Positive Answers for Inclusion of Item
			$\bar{X} \pm 1.2\sigma$
Agriculture	20.36	7.98	11 -- 30
Arts	15.54	8.84	6 -- 26
Commerce	16.56	6.90	8 -- 25
Education	17.50	7.65	9 -- 27
Engineering	37.19	7.22	28 -- 45
Law	19.37	10.34	7 -- 31
Medicine	21.79	8.69	12 -- 32
Social Science	18.58	9.46	7 -- 30

TABLE VII: Derivation of the Ranges used in narrowing the choice of items in the final form of the inventory. (For the original distribution, see Appendix.)

Items which had collected a preponderance of preferences on the one hand, or those for which little or no preference had been shown on the other, were a complete loss as far as identifying fields of interest was concerned. The first step was to eliminate this type of item which was wasting time and space. The formula $\bar{X} \pm 1.2\sigma$

as a standard of acceptance for an item was chosen arbitrarily. Its main purpose was to trim off those items whose scores were extreme, and at the same time to salvage a sufficient number of items to compile a test of usable length. Both of these objects it accomplished satisfactorily; it eliminated approximately 19 per cent of the items used in the prototype but left considerably more than enough to set up the inventory in its new form. Discussion of the items discarded follows in a later section.

12. Item Arrangement in the Final Form of the Inventory

Weight of Item	-3	-2	-1	M	1	2	3
Agriculture	11-13	14-16	17-19	20-21	22-24	25-28	29-31
Arts	6-8	9-11	12-14	15-17	18-20	21-23	24-26
Commerce	8-9	10-12	13-15	16-17	18-20	21-23	24-25
Education	9-10	11-13	14-16	17-19	20-22	23-25	26-27
Engineering	27-29	30-31	32-34	35-36	37-38	39-40	41-42
Law	9-11	12-14	15-17	18-20	21-23	24-26	27-29
Medicine	12-14	15-17	18-20	21-23	24-26	27-29	30-32
Soc. Science	8-10	11-13	14-16	17-19	20-22	23-25	26-28

TABLE VIII: Weights assigned to items and used as a basis of matching pairs in the final form of the inventory.

Distributions of preferences for items in each field were analyzed to find the mean number of positive indications per item as given in Table VII. These means were used as a central point for the weighting of items for matching, that is, to insure the pairing of items whose levels in their respective fields were about the same. The items used in each field were classified in seven groups, the middle group in each case containing the mean, and the three groups on either side deviating from the middle group by balanced intervals.

In the final form of the inventory included in the Appendix the weight of each item according to Table VIII is shown. Table IX shows the weight distribution of items used for each field of interest.

Weight of Item	-3	-2	-1	M	1	2	3
Agriculture	3	8	7	8	9	4	3
Arts	3	9	6	9	5	7	3
Commerce	2	6	9	10	8	6	1
Education	4	9	7	10	6	4	2
Engineering	3	5	7	8	8	6	5
Law	4	6	7	11	7	5	2
Medicine	5	8	8	11	5	2	3
Soc. Science	3	3	10	14	4	3	5

TABLE IX: Distribution by Weight of the items used in the final form of the inventory.

As Table IX shows the greater proportion of the items for the final form of the inventory have been chosen from those which drew close to mean scores in the prototype. By matching items at almost the same level it is hoped to get a better identification of the individual's interest profile for the eight fields. It is also hoped that the Engineering field will be brought more into line with the others.

For the arrangement of items the basic pattern of Table I was used again, repeated six times for the final form of the inventory. This gives 168 pairs of items in which each field is matched six times with each other field, and the possible total for each field is 42. It is thought that with the careful choice of items this length of inventory will give as reliable results as a longer form. Should this assumption not be borne out some 40 percent of the items of the prototype are still available and additions could be made easily.

13. Discarded Items

Of the items eliminated by the formula of Table VII, there are some odd activities that do not follow any particular pattern and the reason for the high or low score of each is questionable. Many others seem to conform to a few general types of activities, and the following lists are a classification of these.

A. Items Eliminated Because of a High Score

(a) Activities with which prestige is associated, which imply a position of authority, or the accumulation of wealth.

Agriculture:

1. Work as a foreman on a government experimental farm.
2. Own and operate your own 'model farm'.
3. Supervise a carefully planned project of large-scale land clearing and cultivation.
4. Work as divisional superintendent of a large irrigation district.

Arts: 5. Be a well known war correspondent.

Commerce:

6. Manage a large store or division of a corporation.
7. Be the provincial supervisor of a chain of stores.
8. Open a broadcasting station in a new area.
9. Handle the renting of a large number of cottages at a summer resort.

Education:

10. Be known and recognized as the teacher of many good students.

Engineering:

11. Supervise the operations of a seimographic survey party.

Law: 12. Be concerned with the enforcement of the law.

Medicine:

13. Join the Banting Research Foundation in Toronto.

14. Win a Nobel prize for research in the field of medicine.

Social Science:

15. As personnel director of a large firm, supervise selection, placement, and promotion of employees.
16. Win a Nobel Peace Prize.
17. Own and operate a movie theatre.
18. Take a course in how to win friends and influence people.

(b) Activities that give satisfaction through the opportunity of doing things for other people, either individually or collectively.

Agriculture:

1. Study the problem of coyote and wolf control in an effort to extend the present sheep-ranching areas.
2. Study the effect of wholesale clearing of forest areas on moisture conservation and soil drifting.
3. Study possible improvements in methods of forest fire prevention.
4. Study the possibilities for irrigation in a drought-stricken area.

Education:

5. Offer high school students information on possible careers.
6. Help young people to circumvent handicaps they may have.
7. Show an inexperienced worker how to operate a machine.
8. Help a shy and diffident child to gain confidence in the presence of others.

Law: 9. Fight for the rights of the average citizen.

Medicine:

10. Assist a crippled child to gain the use of its limbs.
11. Study the nature of cancer and try to find a cure for it.
12. Discover the cause of the common cold.
13. Invent an artificial lung which will allow the wearer freedom of movement.

Social Science:

14. Comfort and help a lost, hurt, or frightened child.
15. Organize emergency relief for a flood-stricken area.
16. Be known and recognized as the friend and helper of the unfortunate and outcast.

(c) Activities which suggest the unusual, the sensational, or the novel.

Agriculture:

1. Use aerial photographs to plan a reforestation and contour cultivation project.

Education:

2. From a graduating class select the student most likely to succeed.

Engineering:

3. Experiment with gaseous mixtures to vary coloring in fluorescent lighting systems.
4. Carry out the analysis of a strange substance under the spectroscope.

Law: 5. Gather evidence to show that a fire was the result of arson.
6. Attend the sittings of a criminal court.
7. Read the police column of the daily newspaper.
8. Read true accounts of famous trials.

Medicine:

9. Read detailed accounts of the 'Black Death' and the 'Plague'.
10. Read about the use of aluminum foil in the treatment of burns.
11. Develop a light-weight plastic suitable for use in bone repair.
12. Adapt new and powerful drugs to more general use.

Social Science:

13. Study the effect of shock treatment in restoring memory.
14. See a film which gives the thought as well as the words of people appearing in it.
15. Investigate the power and uses of hypnotism.

(d) Activities which lead to new experiences, the seeing of new places, and meeting of new people.

Agriculture:

1. Search for the nesting grounds of the whooping crane.

Arts: 2. Visit a famous museum.

3. Study the arts and crafts of the Canadian West Coast Indians.
4. Go on a conducted tour of Westminster Abbey.
5. Open a broadcasting station in a new area. (Also under (a)).

Engineering:

6. Work for the National Research Council.

Social Science:

7. Interview applicants for a position that has been advertised.
8. Travel and see at first hand how other people live and behave.
9. Study the conditions that seem to lead to juvenile delinquency.

(e) Activities associated directly or indirectly with the athletic world.

Commerce:

1. Act as statistician of a junior hockey league.

Education:

2. Spend an hour a day coaching a 'teen-age basketball team.
3. Accompany a junior hockey team to all its practices and games.

Law: 4. Draw up the rules of operation for a local hockey league.

(f) Activities which emphasize 'doing', practice rather than theory.

Agriculture:

1. Plan and instal a complete water pressure system in farm buildings.
2. Work on the eastern watershed rehabilitation project.

- Arts: 3. Learn to blow intricate glass ornaments.
4. Learn enough German to allow reading of reference books in the language.
5. Read Shakespeare's 'As You Like It'.

Commerce:

6. Become skilled in the operation of business machines.
7. Determine the production cost of a new automobile.

Education:

8. Demonstrate an experiment in physics before a high school class.
9. Demonstrate procedure in wiring an electric switch.
10. Work with a group of better than average students.

Engineering:

11. Analyze and determine the value of a sample of ore.
12. Examine a formation containing silver deposits and decide on the most suitable method of extraction.
13. Earn part of your university expenses as a laboratory demonstrator.
14. Use differentiation as a tool in solving the problems of engineering.

- Law: 15. Set up an argument that is logically sound.

Medicine:

16. Identify bacteria present in a sample of drinking water.
17. Mix chemicals in prescribed quantities to produce medicines.

B. Items Eliminated Because of a Low Score

- (a) Activities that have to do with the reporting of events or procedures.

Agriculture:

1. Edit the farm news page in a weekly newspaper.
2. Conduct the veterinary column in a farm weekly.
3. Compile agricultural production figures for the Dominion Bureau of Statistics.

Arts: 4. Write a thesis on the evidence of Puritan influence in the writings of John Milton.

5. Write the screen continuity for 'Ivanhoe'.

6. Re-write Chaucer for modern, popular reading.

Commerce:

7. Edit a weekly market report.

8. Edit the stock market page of a daily newspaper.

Education:

9. Record the minutes of an annual ratepayers' meeting in a large school division.

Medicine:

10. Conduct the health column of a weekly newspaper.

(b) Aversion to activities in which some embarrassment might be felt because of the intimacy involved.

Law: 1. Collect evidence for the entering of suit for divorce.

Medicine:

2. Instruct young mothers in the proper methods of baby care.

3. Examine and give treatment or advice to a childless married couple.

4. Examine a person's teeth for cavities.

5. Examine teeth and gums for possible abscesses and sources of infection.

6. Examine a person for the presence of a suspected eye infection.

7. Extract an aching tooth for a small child.

Social Science:

8. Lead a large group of people in a spiritual revival.

9. Visit homes to help people with their personal and family problems.

10. Offer spiritual comfort to someone in distress.

(c) Activities which impose restrictions on the individual, or to which real or imagined social disapproval is attached.

Commerce:

1. Do the advance publicity work for a circus.

Education:

2. Adapt your code of behavior to standards largely dictated by others.

Engineering:

3. Devise an effective method of sewage disposal for a small city.

Law: 4. Act as the local truant officer.

Social Science:

5. Supervise a provincially operated orphan's home.

(d) Unfamiliar activities or situations.

Arts: 1. Modify classic ballet to present it with popular appeal.

2. Organize the program for a proposed revival of the Chautauqua circuit.

Education:

3. Do research on the eye movements involved in reading.

4. Criticize the philosophy of John Dewey as a basis for education.

5. Plan and administer a program of remedial work for poor spellers.

Engineering:

6. Experiment with various solvent solutions for the cleaning of burettes.

7. Study about the law of chance and normal distributions.

8. Invent a new unit of angular measurement.

9. Study the theory of sampling.

10. Evaluate the architectural soundness of buildings like the Parthenon.

Medicine:

11. Prescribe therapy for a person whose hands are paralyzed.

12. Prescribe a diet designed to check scurvy in an advanced stage.

Social Science:

13. Study the English Borstal system.
14. Be president of the local John Howard Society.

The above lists classify approximately 68 per cent of the discarded items. Of the remainder a great many are isolated activities that do not lend themselves readily to grouping. Particularly among those eliminated for low score, there are items of faulty wording or uncertain meaning as well as some activities that appear definitely unsuitable after they have been tried out and given more careful consideration. The following will serve as examples of unsuitable items:

1. Experiment with new techniques of handling and saving delicate turkey poults.
2. Study the part played by early French culture on intellectual progress in Canada.
3. Trace the changes in civil law in Quebec from the time of the Quebec Act to the present.
4. Handle the legal work of an antivivisectionist society.
5. Study the moral implications of Anglo-Saxon law.
6. Study the place of the individual and the home in primitive societies.

CHAPTER VI. CONCLUSION

The preliminary work on the 'Professional Interest Inventory' has shown both possibilities and faults in the techniques used. These may be summarized briefly as follows:

1. The type of activities chosen for the inventory have shown some ability to differentiate and define interests in the professional fields.
2. The method of completion has proven satisfactory for simplicity of administration and speed of checking. Further investigation of the significance of 'Both' scores is needed.
3. The common interest factor has turned up in the field of Engineering instead of in Arts as expected. Further data and study will be required to reduce the Engineering field to its proper perspective.
4. The arbitrary, and largely subjective, procedure for elimination of items is not regarded as reliable. If the final form of the inventory is to be developed further a more objective method of item selection should be devised.
5. The items chosen for each field proved satisfactorily consistent in comparison with standards published for similar tests now in general use.
6. Overlapping of certain fields is undesirably high and must result in some distortion of profiles. Further study of this aspect is needed.
7. No reliable conclusion can be drawn from the data on stated occupational preference.
8. 'Neither' scores have not proven to be as significant as expected.

9. Study of the items discarded revealed certain groups of activities toward which there appeared a common attitude of interest in some cases and of aversion in others.

There has been a determined effort in the setting up of the final form of the inventory to emphasize the possibilities and to correct the more obvious faults. To what extent these have succeeded, and to what extent the shorter inventory will fulfil its purpose can only be estimated from the analysis of further data when it is available.

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9. The calendars of the following Canadian and American universities and colleges:

(a) Alberta	(m) Saskatchewan
(b) British Columbia	(n) Southern California
(c) Carleton College	(o) Stanford
(d) Colorado School of Mines	(p) Toronto
(e) Dalhousie	(q) Washington
(f) Manitoba	(r) Western Ontario
(g) Massachusetts Institute of Technology	
(h) McGill	
(i) McMaster	
(j) Mount Allison	
(k) New Brunswick	
(l) Queen's	

APPENDIX

Distributions of Scores Studied.

Statistical Procedures Used.

'Professional Interest Inventory'
in its short, revised form.

Interval	Agric.	Arts	Com.	Educ.	Engin.	Law	Med.	S. Sci.
105 - 111					4			1
98 - 104			1	1	4	1	2	1
91 - 97	2			1	9		1	
84 - 90	3		1		8	1		1
77 - 83	3	2		2	5	2	1	1
70 - 76	3			2	4		2	1
63 - 69	3	1	2	4	8	2	2	3
56 - 62	4	3	4	3	8	3	6	2
49 - 55	3	4	5	1	5	3	6	4
42 - 48	5	5	5	5	1	4	6	7
35 - 41	1	3	4	8	1	9	4	14
28 - 34	6	12	9	10	5	9	9	12
21 - 27	9	15	14	13	2	12	11	6
14 - 20	9	12	6	9	3	13	9	9
7 - 13	8	10	13	11	2	9	9	6
0 - 6	11	3	6		1	2	2	2
N =	70	70	70	70	70	70	70	70

TABLE X: Distribution of total scores in eight fields for positive indications of interest on the answer sheets of 70 Grade XII boys.

The distribution shown in Table X is the basis for the statistical measures shown in Table II and Table III. Method of calculating these measures is shown in connection with Table XI on the following page.

Interval 'i'	Frequency 'f'	Computation Interval 'U'	'fU'	'UfU'	Cumulative Frequency $'\Sigma f_{cum}'$
105 - 111					
98 - 104					
91 - 97	2	9	18	162	70
84 - 90	3	8	24	192	68
77 - 83	3	7	21	147	65
70 - 76	3	6	18	108	62
63 - 69	3	5	15	75	59
56 - 62	4	4	16	64	56
49 - 55	3	3	9	27	52
42 - 48	5	2	10	20	49
35 - 41	1	1	1	1	44
28 - 34	6	0	0	0	43
21 - 27	9	-1	-9	9	37
14 - 20	9	-2	-18	36	28
7 - 13	8	-3	-24	72	19
0 - 6	11	-4	-44	176	11
$N = 70$			$\sum fU = 37$	$\sum fU^2 = 1089$	

$$\begin{aligned}
 \text{Number of cases (N)} &= 70 & \bar{U} &= \sum fU/N \\
 \text{Interval (i)} &= 7 & &= 37/70 \\
 \text{Computation origin } (i_c) &= 31 & &= 0.529 \\
 &&&= 31 + (7 \times 0.529) \\
 &&&= 34.703 \\
 \text{Computation mean } (\bar{U}) & & U^2 &= \sum fU^2/N \\
 \text{Mean } (\bar{X}) & & &= 1089/70 \\
 \text{Standard Deviation } (\sigma) & & &= 15.56 \\
 \text{Median} &= 21 + (7/9 \text{ of } 7) & \sigma_U &= \sqrt{\bar{U}^2 - \bar{U}^2} \\
 &= 26.44 & &= \sqrt{15.28} \\
 & & \sigma_X &= i \cdot \sigma_U = 27.37
 \end{aligned}$$

TABLE XI: The Agriculture distribution of Table X showing the procedure used in computing the Medians, Means, and Standard Deviations of Tables III and VII.

Interval	Agric.	Arts	Com.	Educ.	Engin.	Law	Med.	S. Sci.
48 - 51					8	1		
44 - 47		1	1		14			1
40 - 43	1	1			25		4	4
36 - 39	5		1	4	25	3	3	4
32 - 35	6	3	2	3	19	7	10	3
28 - 31	7	7	4	4	10	5	9	8
24 - 27	14	8	5	11	10	9	15	7
20 - 23	27	16	14	15	3	16	27	16
16 - 19	21	12	26	19	1	15	17	25
12 - 15	17	17	29	25		31	11	19
8 - 11	10	27	20	19		14	9	15
4 - 7	3	18	4	6		10	4	12
0 - 3	1	2					1	

TABLE XII: Distributions of positive indications of interest per item for each of the major fields of interest.

In this table the interval is the number of positive answers, and the frequency is the number of items in that interval. For example, under Agriculture, twenty-seven items had positive scores from twenty to twenty-three. For these distributions N should equal 112 in each case but due to errors and omissions in duplication some slight discrepancies occur in totals. However, the measures in Table VII computed from these distributions have all been calculated on the basis of N = 112.

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21
1	X	0-3	4-7	8-11	12-15	16-19	20-23	24-27	28-31	32-35	36-39	40-43	44-47	48-51							
2	Y	✓	U	-3	-2	-1	0	1	2	3	4	5	6	7	8	9	Σf	V	$f_a V$	$V f_a$	$\Sigma f_a V$
3																		N	=	T_a	
4																					
5																					
6																					
7																					
8																					
9																					
10																					
11																					
12																					
13																					
14																					
15																					
16																					
17																					
18																					
19																					
20																					
Σf	Uf _a	Uf _v	U	Σf																	
Vf _a	Vf _v	V																			

AGRICULTURE:

X: TOTAL CHOICES FOR AGRICULTURE

PAGES 142 OF ANSWER SHEET

Y: THE SAME, PAGES 344.

$$N = T_a$$

$$\bar{U} = \frac{\Sigma f_a U}{N} = \frac{83}{70} = 1.186$$

$$\bar{V} = \frac{\Sigma f_a V}{N} = \frac{60}{70} = 0.857$$

$$\bar{U}^2 = \frac{\Sigma f_a U^2}{N} = \frac{1013}{70} = 14.471$$

$$\bar{V}^2 = \frac{\Sigma f_a V^2}{N} = \frac{800}{70} = 11.429$$

$$\sigma_U = \sqrt{\bar{U}^2 - \bar{U}^2} = \sqrt{14.471 - 11.429} = 3.271$$

$$\sigma_V = \sqrt{\bar{V}^2 - \bar{V}^2} = \sqrt{11.429 - 10.857} = 0.562$$

$$\bar{U}V = \frac{\Sigma f_a UV}{N} = \frac{836}{70} = 11.943$$

PEARSON'S COEFFICIENT

OF CORRELATION:

$$r = \frac{\bar{U}V - \bar{U}\bar{V}}{\sigma_U \sigma_V}$$

$$= \frac{11.943 - (11.429 \cdot 0.857)}{3.271 \cdot 0.562} = 0.9243$$

checks

TABLE XIII: CALCULATION OF PEARSON'S

COEFFICIENT OF CORRELATION FOR

SPLIT-HALF SCORES IN THE FIELD OF

AGRICULTURE.

PROFESSIONAL INTEREST INVENTORY

The following items are designed to separate and identify your interests in the professional fields for which university training is required. Items are paired throughout the inventory and you have the choice of one of four possible responses to each pair of items.

- L - preference for the Left column item.
- B - like Both items about equally.
- N - like Neither item.
- R - preference for the Right column item.

All your responses are to be marked on the separate answer sheets provided. Please do not make any marks on this form. Be sure to choose one of the possible answers for each pair of items and record your choices on the answer sheet thus:

- | | | | | | |
|--|---|---|---|---|---|
| | L | B | N | R | . |
|--|---|---|---|---|---|
1. X Little or no liking for either item.
 2. X Prefer the item on the left-hand side.
 3. X Prefer the item on the right-hand side.
 4. X Liking for both items but no preference for one over the other.

Read each item carefully but work through the list fairly rapidly. Do not consider necessary qualifications, possible pay, or prestige; just think of whether or not you would like to do the things mentioned and which you would most prefer to do. In deciding on your preference for one item or the other, remember that first impressions are generally as reliable indications of interest as decisions that require reflection. There are no right or wrong answers. Now turn the page and go ahead.

1. Conduct a famous symphony orchestra. (M,M) Manage a large creamery in a semi-rural area.
2. Maintain a patient and helpful attitude toward a rude and critical customer. (M,M) Justify the efforts of the school to the parents of a backward student.
3. Develop a transparent varnish impervious to acids. (M,M) Frame legislation designed to prevent the wholesale clearing of land on Alberta's eastern watershed.
4. Plan and conduct a research project on the diseases common among the American Indians before the coming of white men. (M,M) Try to trace back to their origin the writings comprising the Old Testament.
5. Study the latest developments in modern agricultural science. (M,M) Take university courses in accounting and business methods.
6. Make a survey to determine the things that interest children of elementary school age. (M,-1) Gather data for making contour maps of a given area.
7. Define the circumstances under which an individual is not held to be responsible for his actions. (M,M) Identify and prescribe treatment for a rare type of skin disorder.
8. Select the most promising salesman from a large group of applicants. (M,M) Collect samples of Camera Club work and prepare them for exhibition.
9. Administer tests to determine the ability of children to learn. (M,M) Carry out exhaustive tests to determine the milling qualities of a new wheat.
10. Perform an autopsy on a body to determine the cause of death. (M,-1) Analyze a company's accounts to discover the chief cause of credit losses.
11. Serve as a judge of the juvenile court. (M,M) Become a superintendent of schools.
12. Plan and install a water and sewage disposal system in a small town. (M,M) Organize recreational services for a large group of industrial workers.
13. Study the origin and meaning of words. (M,+1) Make a study of tropical diseases.
14. Plan a large-scale re-grassing project to control soil erosion. (+1,-1) Carry out experiments with new techniques designed to control the weather.

15. Make a survey of the reading (M,M) tastes of Canadians. Do the necessary research and report on the buying habits of the Canadian people.
16. Learn how to recognize the (+1,-2) symptoms of common ailments. Try to discover the reason for a child's inability to learn to read.
17. Campaign for public office. (-1,+1) Write a prize-winning drama.
18. Study the effect of different light filters in experimental photography. (M,M) Investigate the part played by rats in the spread of certain diseases.
19. Write human interest features for a popular magazine. (-1,-2) Design a set of posters to promote weed recognition among farmers.
20. Search for information that (+1,+1) would throw new light on some famous event of history. Report on the origin and growth of banking systems.
21. Work as field supervisor and (+1,+1) weed inspector for a large municipality. Follow a career as a referee in professional hockey.
22. Oversee the carrying out of (M,M) an important student enterprise. Supervise a summer camp for underprivileged children.
23. Make and record meteorological (+2,+2) observations. Work as a professional entertainer.
24. Report on the part played (-2,-2) by barter in early Canadian trade development. Study the development of Dominion-Provincial relations since Confederation.
25. Test large numbers of people(M,M) for tuberculosis symptoms. Inspect and test dairy herds for tuberculosis.
26. Study, collect, and search (+1,+1) out the origins of current high school slang. Try to discover the general patterns or processes by which people learn.
27. Guard the legal rights of (+1,M) water users in an irrigation district. Campaign to make medical services available to people of all economic levels.
28. Learn to read and interpret (M,M) various common types of map projection. Learn to read and interpret published financial charts.
29. Collect, press, and mount (-2,-1) specimens of plant life common to your own locality. Collect recordings of famous orchestrations.
30. Check students' written work for ideas present. (-1,-1) Carry out the annual audit on a company's books.

31. List for enforcement the minimum standards of skill required to obtain a private driver's license. (+3,+2) Design a safe system of turns and overpasses for a busy highway intersection.
32. Study the effect of standards of living on national attitudes and behavior. (M,+1) Carry out research to determine the effect of various national diets on athletic endurance and efficiency.
33. Set up the filing system in a new government department. (-1,-1) Decide on the type of crop most suitable to a particular farming locality.
34. Direct the installation of a new transformer in the city power plant. (+1,-1) Supervise a thirty-minute playground period each day for a group of ten-year-old boys.
35. Become the provincial Minister of Health. (-3,-1) Become Attorney-General of the province.
36. Through observation and research try to determine the most significant factors in the development of personality. (M,M) Define 'culture' and try to discover the aspects of national life that contribute to its development.
37. Lead a group of 'teen-agers in a frank and open discussion of their problems. (+1,+1) Work as field man for an implement agency to correct operational and other problems involving new machinery.
38. Sell life and accident insurance. (-2,-2) Administer the anaesthetic for a surgical operation.
39. Help young people to focus their interests. (M,M) Interpret the law in the case of juvenile offenders.
40. Test public opinion on some current problem after the manner of the Gallup Polls. (-3,-3) Test the sound absorption qualities of various types of building lining materials.
41. Take patients' temperatures and keep charts. (-2,-2) Work in the public library.
42. Determine the gasoline-saving possibilities of a new carburetor. (+1,+1) Assess the value of land throughout a municipality.
43. Sign articles to serve with a firm of accountants. (-1,-1) Do clinical work with a mental health unit.
44. Assist a stammering child to discover the cause of his handicap, and if possible, to remedy it. (M,M) Administer artificial respiration in a case of apparent drowning.
45. Take a leading part in the annual play produced by the Drama Club. -(M,M) Act as chairman of a political discussion group.

46. Experiment with radiant energy in the healing of damaged muscle tissue. (+3,+3) Search for a new and efficient means of transmitting radiant energy.
47. Specialize in the selective breeding and raising of beef cattle. (-1,-1) Study and put into practice the principles involved in recreational supervision.
48. Prepare the monthly payroll for a division of a large transport company. (+2,+2) Write a novel of enough significance to rate 'Book-of-the-Month' Club selection.
49. Search old court records for a required precedent-setting judgment. (-2,-2) Make surveys and crop yield predictions for publication.
50. Use scientific tests in an effort to diagnose some personality disorder from which a patient is suffering. (+1,+2) Use standardized tests to classify the difficulties experienced by backward students.
51. Do crossword puzzles. (+2,+2) Work mathematical puzzle problems.
52. Draw up a long-term advertising contract between a nationally known magazine and a large manufacturing concern. (-1,-2) Determine the size of the potential market reached through such an advertising medium as the 'Toronto Star Weekly'.
53. Demonstrate a new technique in control of certain noxious weeds. (M,M) Demonstrate to a group of medical students the correct technique of removing a diseased appendix.
54. Provide the steady influence for the youth and enthusiasm of a student government group. (-1,-1) Arrange the musical accompaniment for a documentary film short.
55. Become an authority on the civil law codes in effect in the various Canadian provinces. (M,M) Work with an organization which provides opportunities for the crippled and blind.
56. Learn the principles of statistical treatment of data. (-1,-1) Study the characteristics of crystal vibration.
57. Arrange a collection of famous paintings for exhibition. (-2,-1) Feed and train a purebred calf for exhibition.
58. Join the University International Relations Club. (+2,-1) Join the Math-Science Club at University.
59. Teach plant science in an Agricultural School. (+1,-1) Teach commercial arithmetic in a business college.
60. Set a broken arm. (M,M) Sum up the prosecution's case before the jury.

61. Observe and attempt to direct the development of thinking in young people. (M,M) Oversee a soil conservation program sponsored by a municipality.
62. Check various kinds of contracts for possible legal loopholes. (-1,-1) Check students' mathematics assignments for errors in work.
63. Make pencil and charcoal sketches of people and animals. (-1,-1) Prepare film strips to illustrate visible symptoms of common diseases.
64. Investigate the relation of people's interests to their social and economic status. (+1,+1) Study and compare the various coinage systems in use in the world today.
65. Prepare a brief to present to an investigating commission. (-3,-3) Translate a famous French classic into English for the first time.
66. Assist people to gain some degree of certainty in their thinking about themselves. (+2,+2) Act as demonstrator and practical instructor for a farm implement agency.
67. Study the swarming habits of bees. (-2,-2) Trace the growth of law-making under the Romans.
68. Develop a turbo-jet-powered snowmobile. (M,M) Design and make a piece of decorative, artistic pottery.
69. Carry out research on the nature and occurrence of undulant fever. (-2,-2) Experiment with cross-breeding in an effort to improve laying strains in poultry.
70. Accept the responsibility of deciding whether or not an offender is guilty as charged. (-2,-2) Evaluate the relation of moral standards to occurrence of delinquency in any society.
71. Learn the use of determinants in solving simultaneous equations. (+1,+1) Learn how to calculate the cash value of notes, annuities due, and instalment payments.
72. Assist in the cataloguing of a famous art collection. (-2,-2) Take an inventory of the skills and knowledge of a high school mathematics class.
73. Find out why a product known to be good is not selling. (+1,+1) Try to convince people whose opinions differ from yours.
74. Give small children their first introduction to written symbols. (-3,-3) Perform such offices of the church as baptism and marriage.
75. Review new books for a popular book club. (+2,+2) Search out faulty business methods that are causing a firm to lose money.

76. Carry out chemical research (-2,-3) Experiment with new techniques aimed at producing synthetic hormones.
77. Prepare slides of various types of germs for purposes of comparison under the microscope. (+2,+2) Teach children to recognize familiar birds and animals.
78. Care for experimental grain plots in a seed development project. (-3,-3) Use and care for precision meters and other delicate measuring instruments.
79. Devise safer and easier ways of handling radio-active substances. (+3,+3) Work on an international commission for the control of atomic energy.
80. Prepare and mount for study a specimen of human nerve tissue. (-2,-2) Prepare an inventory of stock on hand for a business about to be sold.
81. Study the implications of increasing life expectancy in relation to shrinking world food production. (-1,-1) Study the influence of Latin on English word structure and grammar.
82. Outline appropriate courses of study for the junior high school. (-3,-1) Draft plans for a new type of roller bearing.
83. Experiment in an effort to determine the effect of diet on night vision. (-2,-1) Assist in the re-establishment of an ex-convict in normal social surroundings.
84. Follow a career in banking. (+2,+2) Follow a career in teaching.
85. Take a part in framing what appear to be necessary laws. (M,-1) Study human attitudes and habits and try to promote understanding and improvement of them.
86. Eliminate a developing patch of Leafy Spurge. (-2,-1) Seek out a source of typhoid contamination.
87. Learn to distinguish between good writing and trash in the field of modern fiction. (+2,+2) Apply trigonometric principles to air navigation.
88. Act as farm manager for a large co-operative, agricultural enterprise. (+2,+1) As a corporation lawyer guard the interests of a large merchandising firm.
89. Demonstrate and lecture on farm mechanics at local fairs and field days. (-2,-2) Offer spiritual comfort to a person approaching death.

90. Take the leading part in the (M,+1) Draw up the constitution under annual play of the Drama Club. which a new club is to operate.
91. Take charge of the junior (+3,+3) Interview unemployed persons staff in a large accounting office. with a view to placing them in jobs.
92. Take a St. John's Ambulance (+2,+2) Collect stamps as a hobby. course in your spare time.
93. Win the University's gold (+3,+2) Win the Chief Justice's gold medal in Education. medal in Law.
94. Develop the type of cultivation best suited to the soil and contours of the land you farm. (+1,+1) After careful consideration work out the system of study best fitted to your own ability and needs.
95. Serve in a battle area as a (M,M) Interpret military law in an military surgeon. occupied area.
96. Become a public accountant in(+1,+1) Practice as a veterinary surgeon in a mixed farming district. a large town.
97. Study the factors that contributed to a highway accident before bringing suit for damages. (+1,+2) Experiment with new methods of eliminating the glare from automobile headlights.
98. Judge the entries in a Junior(-1,-2) Take charge of book selections Grain Club exhibition. for a town library.
99. Study the reading interests (-1,-1) Study business conditions in of a 'teen-aged group. Argentina.
100. Analyze the basic social problems facing Canada today. (-1,-1) Dissect a human cadaver in the study of anatomy.
101. Learn to use a slide rule (+3,+3) Help and advise groups of with accuracy and speed. people younger than yourself.
102. Write the newspaper account (-2,-1) Act as master of ceremonies of an alumni banquet. at an alumni banquet.
103. Study the psychology of selling. (+1,+1) Study the effect of fatigue on the body's resistance to germ attack.
104. Compare the concepts of idealism and realism. (M,-1) Compare the elasticities of several alloys of steel.
105. Apply meteorological data to weather prediction. (+1,+1) Plan and carry out the landscaping of the grounds around a Dominion Experimental Station.
106. Serve as president of a Home and School group. (-1,-3) Become city coroner.

107. Withdraw a sample of blood (-1,+1) Prepare plans for blue-printing.
from a patient and carry out a Wassermann test.
108. Study the part played by (-3,-2) Study the art of Renaissance Venice and Genoa in medieval Italy.
109. Conduct a bureau for the (-1,-2) Review new textbooks to discover collection and distribution their possible application to of occupational information. courses taught in our schools.
110. Establish a law office in a (M,M) fast-growing 'boom town'. Serve on the finance committee of your home town council.
111. Spend a summer holiday at- (+2,+3) tending the University Summer Session in Edmonton. Spend a summer holiday attending the Banff School of Fine Arts.
112. Learn further uses of diff-(-1,-1) erentiation and integration. Learn the difference between nominal and effective rates of interest.
113. Plan ballroom decorations (+1,M) and arrangements for outstanding social functions. Select types of trees most suitable for prairie shelter belts.
114. Balance a set of books at (M,+1) the end of a month's business. Read or tell stories to children.
115. Consider several possible (M,-1) railway grades and choose the most favorable. Give a decision in a right-of-way dispute between two railway companies.
116. Conduct a research project (-1,-2) to find a biological reason for the population cycle of the common 'snowshoe rabbit'. Carry out a survey of the religious beliefs represented in this province.
117. Determine the water solubil-(+3,+2) ity of soil minerals in a given area. Analyze the conditions that precede, accompany, and follow a depression.
118. Teach woodworking students (M,-2) how to sharpen edged tools. Calibrate a thermometer.
119. Study and try to foresee (-3,-3) the implications of recent labor legislation. Study the effect of environment in building up certain immunities in the body.
120. Do historical research in (+2,+3) connection with exhibits in a national museum. Investigate the effect of radio propaganda on public thinking.
121. Justify a progressive step (-2,-3) in education to a group of reactionaries. Photograph common noxious weeds for identification purposes.

122. Check sanitary conditions (-1,+1) Do the buying of supplies for in city restaurants. a chain of city lunch counters.
123. Read about the work of such (-3,-3) great legislators as Russell and Disraeli. Read about the work of great educators like Locke and Dewey.
124. Experiment with new types (M,+2) of metal as transformer cores. Supervise the summer camp of some boys' group such as Scouts or Tuxis.
125. As a student of art visit (+3,+3) such famous galleries as the Louvre. Study the after-effects of such anti-fatigue drugs as benzedrine.
126. Make a survey aimed at (-3,-3) minimizing waste by improving milk-marketing methods. Study traffic characteristics at a given point and design adequate automatic control equipment.
127. Compare nature, labor, and (M,+1) capital as agents of production. Learn the comparative symptoms of common personality disorders.
128. Assist at the birth of a (-3,-2) baby. Instruct children in the meaning of acceptable social behavior.
129. Learn about the laws con- (-2,-1) cerning copyrights and trade marks. Study and compare the histories of former civilizations.
130. Watch a steel construction (+3,+3) crew at work. Assist a doctor as he gives first aid at the scene of an accident.
131. Examine the qualifications (+2,+3) of people seeking to adopt a child. Investigate the merits and dangers of aerial spraying and dusting of field crops.
132. Plan and arrange the arts (-2,M) and crafts display for the summer exhibition. Organize and run a pari-mutuel betting system for a small local race meet.
133. Specialize in the growing (-1,-2) of registered seed. Conduct a suit for damages against a trucking company.
134. Serve as chairman of your (-2,-3) divisional school board. Work on the provincial committee for child welfare.
135. Build and operate your own (-2,M) 'ham' radio station. Work as a guide and lecturer in the Royal Ontario Museum.
136. Advise people on the soundness-(+2,+3) of various business schemes. Defend a prisoner accused of murder.
137. Become the country's most (+2,+1) noted brain surgeon. Become the World Wheat King.

138. Make a study of the history (-1,-2) Teach a group of people to and development of music. understand and appreciate good music.
139. Search old land titles to (+2,M) Lead a campaign against graft discover the ownership of mineral rights. and abuses in local government.
140. Determine by analysis the (+1,+2) Conduct a publicity campaign to iodine content of a sample of well water. encourage settlement in a new area of country.
141. Try to develop a pitless (-1,-3) Identify the author of an anonymous cherry. Elizabethan sonnet.
142. Help young people to appre- (+2,+2) Promote the sale of English ciate their own abilities and opportunities. automobiles in Canada.
143. Aid in the revision of the (+1,+3) Design and construct buildings criminal code as particularly applied to juveniles. specially adapted to the climate of this country.
144. Study the social implications (-1,-2) Give medical information on sex of the Kinsey Report. to a young men's club.
145. Offer a weekly bookkeeping (-2,-2) Establish and operate a pet service to city merchants. hospital in the city.
146. Study the characteristics (-2,-1) Organize the first school in and movements of glaciers. a pioneering community.
147. Become the medical superin- (-1,-1) Receive an appointment as a tendent of a large hospital. judge of the Supreme Court.
148. Learn French and German to (+3,+3) Make a thorough study of the the point of being able to life and teachings of Jesus of carry on a debate in either Nazareth. language.
149. Organize subject matter for (-1,-1) Prepare a complete list of directions and equipment needed to start an apiary. speedy and effective learning.
150. Accept and obey orders from (M,M) Accept responsibility for decisions involving the lives of those in authority. others.
151. Accept the responsibility (-2,-1) Act as Crown prosecutor in a of influencing and guiding criminal case. the behavior of a juvenile group.
152. Through study and observ- (M,+1) Design a new type of tire ation try to predict mass tread that will give greatly human behavior under given influences. increased traction.

153. Superintend a provincial (-2,-2) Give history lectures at a sanitarium. prominent university.
154. Adapt fluorescent lighting (+1,+2) Develop a dwarf grass which to street and highway illumination. will eliminate the mowing of lawns.
155. Write a thesis on radio (-1,+1) Evaluate the radio as a power communication as a factor in world business. for good or evil in our modern society.
156. Devise exercises for improving spoken English among children from homes where English is not spoken. (-3,-2) Vaccinate and inoculate school children periodically.
157. Adjudicate a drama festival. (-3,-3) Draw up a last will and testament.
158. Study the causes and physical reactions of the yawn. (M,M) Study about transmission line and wave-guide design.
159. Experiment with the development of new frost-resistant varieties of wheat. (+3,+3) Study the circumstances which give rise to amnesia in an effort to develop a possible cure.
160. Study about the setting up and administration of sinking funds. (-3,-2) Write a magazine article on an assigned subject.
161. Act as chief umpire at a large baseball tournament. (+2,+2) Lecture on the dangers of modern tillage methods.
162. Carry out a research project on hysteria and faith healing. (M,M) Experiment with methods of gaining and holding the interest of children and adolescents.
163. Learn enough Greek to translate from the original. (-M,+2) Study the location and structure of a beaver's dam.
164. Draw up the necessary papers for legal adoption of a child. (+2,M) Audit the books of the city School Board.
165. Work as a travelling salesman for a wholesale drug firm. (-1,M) Sell commercial fertilizers for a large chemical company.
166. Admit and use for emphasis a mistake made while instructing a class. (+1,+2) Write an article on great discoveries that were made as the result of errors.
167. Establish a marriage clinic to help with marital problems and preserve homes. (-1,M) Try to establish the legitimacy of a 'test-tube' baby.
168. Promote the sale of shares in a new mining company. (-2,-2) Devise a means of arresting the sinking of the foundations under a large public building.

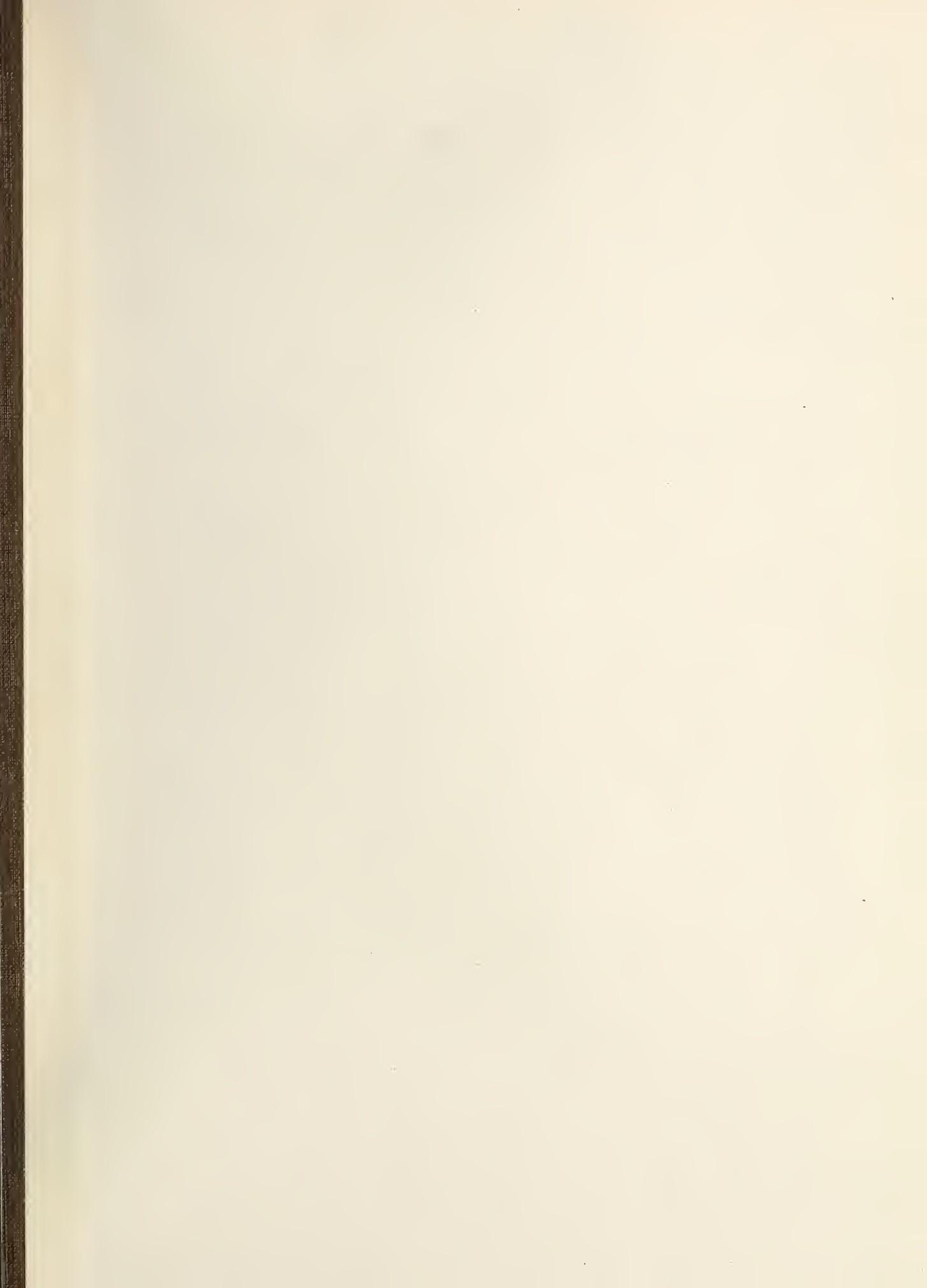
CLASSIFICATION OF ITEMS

Key: Agriculture -- Ag
 Arts -- Ar
 Commerce -- Co
 Education -- Ed

Engineering -- En
 Law -- La
 Medicine -- Me
 Soc. Science -- Ss

1.	Ar - Ag	43.	Co - Ss	85.	La - Ss	127.	Co - Ss
2.	Co - Ed	44.	Ed - Me	86.	Ag - Me	128.	Me - Ed
3.	En - La	45.	Ar - La	87.	Ar - En	129.	La - Ar
4.	Me - Ss	46.	Me - En	88.	Ag - La	130.	En - Me
5.	Ag - Co	47.	Ag - Ss	89.	Ag - Ss	131.	Ss - Ag
6.	Ed - En	48.	Co - Ar	90.	Ar - La	132.	Ar - Co
7.	La - Me	49.	La - Ag	91.	Co - Ss	133.	Ag - La
8.	Ss - Ar	50.	Ss - Ed	92.	Me - Ar	134.	Ed - Ss
9.	Ed - Ag	51.	Ar - En	93.	Ed - La	135.	En - Ar
10.	Me - Co	52.	La - Co	94.	Ag - Ed	136.	Co - La
11.	La - Ed	53.	Ag - Me	95.	Me - La	137.	Me - Ag
12.	En - Ss	54.	Ed - Ar	96.	Co - Ag	138.	Ar - Ed
13.	Ar - Me	55.	La - Ss	97.	La - En	139.	La - Ss
14.	Ag - En	56.	Co - En	98.	Ag - Ar	140.	En - Co
15.	Ss - Co	57.	Ar - Ag	99.	Ed - Co	141.	Ag - Ar
16.	Me - Ed	58.	La - En	100.	Ss - Me	142.	Ed - Co
17.	La - Ar	59.	Ag - Co	101.	En - Ed	143.	La - En
18.	En - Me	60.	Me - La	102.	Ar - Ss	144.	Ss - Me
19.	Ss - Ag	61.	Ed - Ag	103.	Co - Me	145.	Co - Ag
20.	Ar - Co	62.	La - Ed	104.	Ss - En	146.	En - Ed
21.	Ag - La	63.	Ar - Me	105.	En - Ag	147.	Me - La
22.	Ed - Ss	64.	Ss - Co	106.	Ed - Me	148.	Ar - Ss
23.	En - Ar	65.	La - Ar	107.	Me - En	149.	Ed - Ag
24.	Co - La	66.	Ss - Ag	108.	Co - Ar	150.	Co - Me
25.	Me - Ag	67.	Ag - La	109.	Ss - Ed	151.	Ed - La
26.	Ar - Ed	68.	En - Ar	110.	La - Co	152.	Ss - En
27.	La - Ss	69.	Me - Ag	111.	Ed - Ar	153.	Me - Ar
28.	En - Co	70.	La - Ss	112.	En - Co	154.	En - Ag
29.	Ag - Ar	71.	En - Co	113.	Ar - Ag	155.	Co - Ss
30.	Ed - Co	72.	Ar - Ed	114.	Co - Ed	156.	Ed - Me
31.	La - En	73.	Co - La	115.	En - La	157.	Ar - La
32.	Ss - Me	74.	Ed - Ss	116.	Me - Ss	158.	Me - En
33.	Co - Ag	75.	Ar - Co	117.	Ag - Co	159.	Ag - Ss
34.	En - Ed	76.	En - Me	118.	Ed - En	160.	Co - Ar
35.	Me - La	77.	Me - Ed	119.	La - Me	161.	La - Ag
36.	Ss - Ar	78.	Ag - En	120.	Ar - Ss	162.	Ss - Ed
37.	Ed - Ag	79.	En - Ss	121.	Ed - Ag	163.	Ar - En
38.	Co - Me	80.	Me - Co	122.	Me - Co	164.	La - Co
39.	Ed - La	81.	Ss - Ar	123.	La - Ed	165.	Me - Ag
40.	Ss - En	82.	Ed - En	124.	En - Ss	166.	Ed - Ar
41.	Me - Ar	83.	Me - Ss	125.	Ar - Me	167.	Ss - La
42.	En - Ag	84.	Co - Ed	126.	Ag - En	168.	Co - En

TABLE XIV



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